

Endothelial Cells in Blood Smears

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• Smears of blood obtained by venipuncture sometimes contain odd looking cells which occur singly and in sheets. Their presence may suggest a possible diagnosis of infectious mononucleosis, leukemia, or even malignant disease. Actually, they are endothelial cells from the lining of blood vessels. Use of a barbed needle for venipuncture is the cause of such artifacts.

THE CHANCE OCCURRENCE of endothelial cells in blood smears may give rise to erroneous diagnosis. Appearing singly, these cells may simulate abnormal monocytoïd cells of infectious mononucleosis, acute lymphocytic leukemia or monocytic leukemia. Appearing in sheets, they may simulate metastasizing malignant cells. The purpose of this communication is to emphasize the necessity for recognizing these cells.

Recently we examined a smear made from antecubital venous blood drawn from a patient who was convalescing from an abdominal-perineal resection for adenocarcinoma of the rectosigmoid colon. (The surgical specimen showed neoplastic invasion to the serosal surface but no extension to the surgical margins, no involvement of lymph nodes and no invasion of blood vessels.) The blood smear contained large numbers of unusual cells occurring singly and in sheets (Figures 1 and 2). These cells varied from 20 to 30 micra in size, were elongate, tended to be polygonal in outline and had more or less distinct borders. With Wright's stain the cytoplasm was pale blue and occasionally contained fine granules or clear vacuoles. The nuclei were red-purple, oval, and varied in size from 12 to 18 micra. The chromatin net was moderately coarse, and from one to three pale blue nucleoli were present. Cells of this description were found only in the one smear; none were seen in subsequent preparations.

These cells were thought to be of endothelial origin and to derive from the site of venipuncture. However, it was tempting to assume that they represented metastatic tumor, although the passage of sheets as large as these through capillary beds seemed unlikely. For comparison, touch preparations of vein

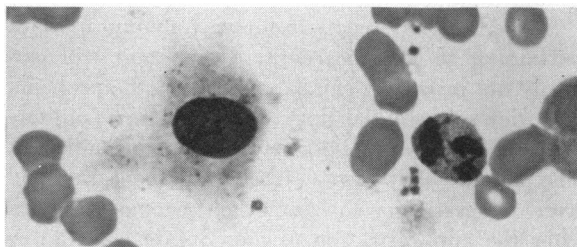


Figure 1.—Single endothelial cell ($\times 690$).

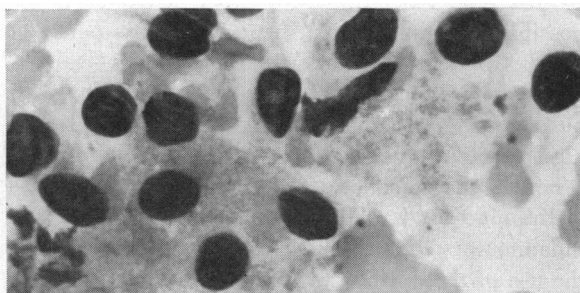


Figure 2.—Sheet of endothelial cells ($\times 690$).

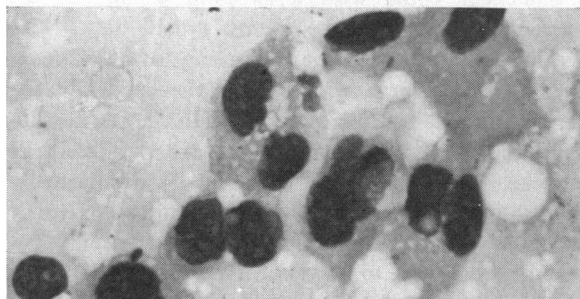


Figure 3.—Touch preparation of vein endothelium from necropsy ($\times 690$).

endothelium obtained at a necropsy were stained by Wright's method. Cells identical with those in the blood smear were found in large numbers (Figure 3).

Shanberge¹ reported similar experience with endothelial cells accidentally appearing in blood smears and gave convincing evidence that they may occur incident to the use of barbed needles for venipuncture.

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REFERENCE

1. Shanberge, J. N.: Accidental occurrence of endothelial cells in peripheral blood smears, *Am. J. Clin. Path.*, 25:460, 1955.

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